CRITICAL ACCESS HOSPITALS:

DOES INCLUSION OF LONG-TERM CARE AFFECT PROFITABILITY?

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EXECUTIVE SUMMARY

The first research question addressed is: Are Critical Access Hospitals (CAH) with Long-Term Care (LTC) units different from those CAHs that do not have LTC units? We began by comparing these two types of hospitals using measures from the hospital cost reports published by Medicare and following the methodology of researchers at the University of North Carolina.[1] They have compared the performance of CAHs, state by state using data on profitability, numbers of patients and employees, holdings of different kinds of assets (i.e. fund balances), and other measures used by business analysts to asses the economic viability of a business. Using these measures we asked such questions as: Do hospitals with LTC units have higher Total Margins than hospitals without LTC units? We call this a "univariate" analysis because hospitals were compared using only one measure at a time. For a multivariate analysis, we used the statistical technique of multiple regression to test the hypothesis that there could be a combination of measures that would identify a difference between the two types of hospitals.

If the evidence shows that hospitals with LTC units are financially weaker than hospitals without such units or different in any material way, the case could be made for more lenient regulation and/or a more favorable Medicare and Medicaid reimbursement formula. Of course, if hospitals with LTC units are financially stronger, the case would be made that more favorable regulation is not needed and, perhaps, there is a more cost effective public policy that could support these facilities.

Comparing the two kinds of hospitals one measure at a time, we found that they do not differ significantly, financially or operationally. Whether it is Total Margin, Gross Total Patient Revenues, Total Expenses, Cash Flow Margin, Salaries to Total Expenses, Deductions and Allowances as Percent of Gross Patient Revenues, Fund Balance, Total General Fund Balance, General Fund Total Assets, Total Assets, Cash, or Days Cash on Hand, the two kinds of hospitals looked very much alike, both before and after becoming a CAH.

We did find that hospitals with LTC units had more employees than those without LTC units and that the additional employees were located in the LTC units. This is a rather trivial conclusion but it is important to note that even with the difference in the number of employees, there was no significant difference in the hospitals' Total Margins, or for that fact, the other financial and operational measures.

We also found that hospitals with LTC units had a smaller ratio of Outpatient Revenues to Total Revenues than hospitals without LTC units. Because patient revenues from LTC units do not qualify as Outpatient Revenues, this seems like a reasonable conclusion. Aside from these two measures, the number of employees and the ratio of Outpatient Revenues to Total Revenues, the univariate analysis did not reveal any differences

[1] CAH Financial Indicators Team, "CAH Financial Indicators Report, State of Idaho," North Carolina Rural Health Research and Policy Analysis Center, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill. Summer 2004.

between hospitals with and without LTC units. Consequently, on the basis of these comparisons, there is little justification for any different regulatory action or compensation scheme.

Using multiple regression to see if there was some combination of variables that could explain the profitability of CAHs we found that when we control for distance to the closest tertiary care hospital, the percent of the county's population in poverty, and the rate of growth in the county's per capita income, there is an inverse relation between the hospital's profitability and the hospital's operation of an LTC unit. These measures of distance to the closest tertiary care hospital, percent of the county's population at or below the poverty level, and the rate of growth in the county's per capita income are not found in the Hospital Cost Reports but come from data provided by the Idaho Department of Health and Welfare and from Census data found in national and state sources.

Thus, while we could find no difference in the Total Margins of Critical Access Hospitals with and without LTC units when comparing them one measure at a time, the multivariate regression analysis did provide evidence that, when controlling for the influence of other factors, LTC units do detract from a hospital's profits.

We also used multivariate regression to test for a set of variables that could explain why some hospitals have LTC units and others do not. In this instance we were trying to find a cause for an LTC unit in a hospital. We found that CAHs are more likely to have an LTC unit if:

- They are located in communities or counties with no private LTC units.
- They are located in communities or counties with a small number of beds in Assisted Living Centers.
- They are located in communities or counties with a large proportion of the population between the ages of 18 and 65.
- They are located in communities with small populations and low per capita incomes.

We observe that there is an LTC unit in virtually every county. Those counties with larger markets are more likely to have long-term care provided by a private firm, whereas in the smaller markets the long-term care is more likely to be provided by the hospital. The size of a market is measured by both population and income. In small counties with high per capita income, (e.g. Blaine County), the long-term care is provided privately. In small counties with lower per capita income, (e.g. Bear Lake County), the service is provided by the hospital.

We have also found evidence that there is some overlap of services between facilities that are designated as LTC units and those facilities that are designated as Assisted Living Centers. The more Assisted Living Centers there are in a county and the more rooms provided in these Assisted Living Centers, the less likely the long-term care will be provided by the hospital.

That LTC units in the hospital may detract from the hospital's profitability could be the result of LTC units being forced into Medicare's Prospective Pay System. One could then make the argument for a more favorable payment scheme, i.e. Cost-Based Reimbursement, for the long-term care provided by hospitals in the smallest markets.

It could also mean that the local market for long-term care is not large enough to warrant the services of a private facility and the hospital is being "forced" to provide the service at a loss or at least at a lower return. In a free market, private firms would have an incentive to either raise their price and/or reduce the quality and quantity of services. Under Medicare regulations and local policy, this may be impossible. This could explain why the existence of LTC units in hospitals is inversely related to profit and could provide an argument for differential regulatory and payment systems.

Given the contradictory results of the univariate analysis vs. the multivariate analysis, though, we are forced to conclude that this issue needs more study before we can confidently recommend any change in policy.

Lastly, we consider the results that address the question of why, in some counties, LTC units are found in hospitals, and in other counties LTC units are privately-owned and operated. As mentioned above, private long-term care is more likely to be found in those counties where the population and income can support a private facility. It is reasonable to predict then, that as incomes and population grow in these small counties, the LTC units in the hospitals will be subject to a greater degree of competition and the number of LTC units in rural hospitals will decline over time. This will be most noticeable (1) in those counties close to large urban areas that become bedroom communities for the metropolitan area, (e.g. Gem County), and (2) in those counties experiencing the most rapid growth in population and income, (e.g. Valley County). The competition will be less in the more rural counties with smaller populations and less growth in income, (e.g. Bear Lake County). We wouldn't be so presumptuous as to predict a time schedule.

If LTC units in small rural hospitals are a "declining industry", it provides the basis for arguing that the reimbursement scheme need not be changed and that what we are seeing is a de facto deregulation that will solve the problem as private facilities take market share from the hospital-based facilities. This conclusion applies only to a specific type of county whose population and income are growing more rapidly than others. For the traditional small rural county, with little or no growth, this offers no solution.

INTRODUCTION

The Medicare Rural Hospital Flexibility Program (FLEX Program) was created by the Balanced Budget Act of 1997. The FLEX Program supports the designation of Critical Access Hospitals (CAH) in rural communities and provides grant funds to states to improve access to care in these communities through the development of networks, quality improvement programs and integrated emergency medical services. Hospitals designated as CAH receive cost-based reimbursement from Medicare and Medicaid. Previous research funded by the Idaho Department of Health and Welfare, Office of Rural Health, undertook an evaluation of the economic impact that CAH designation may have had on these hospitals. That research found that overall, the profitability of hospitals improved after designation as a CAH. However, a great deal of variability among hospitals was noted. It was posited that perhaps hospitals with a Long-Term Care (LTC) unit may fundamentally differ from those without.

Thus, the primary questions addressed in this research are:

1. Are CAH hospitals with LTC units different from CAH hospitals without LTC units?
2. Why is long-term care provided by the hospital in some counties while in others it is provided by the private sector?

METHODS

The task of determining the impact CAH status has had on the profitability of hospitals is facilitated by the availability of detailed financial reports required from each hospital by the federal government. These reports are commonly known as the Medicare Cost Report, and are compiled and released by the Centers for Medicare & Medicaid as the Healthcare Cost Report Information System (HCRIS) Dataset. The Hospital Release 2.0, July 15, 2004, was used for this research. The data were downloaded from: http://www.cms.hhs.gov/data/download/hcris_hospital. The annual reports for every hospital in the U.S. for fiscal years ending on or after September 30, 1996, and received into HCRIS by March 31, 2004, were included. The data files contain the highest level of Medicare cost report status. If HCRIS has both an "as submitted" and a "final settled" report for a hospital for a particular year, the data files will only contain the final settled report. If HCRIS has an "as submitted", "final settled", and "reopened" report for a hospital for a particular year, the data files will contain the reopened cost report. There are literally thousands of lines of data for each hospital for each fiscal year and one of the early tasks was to identify the data needed and then to write the program to retrieve the data.

We downloaded data for every small, rural hospital in the state designated as CAH by the Idaho Department of Health and Welfare. We extracted data for the hospitals in:

American Falls: Harms Memorial Hospital
Arco: Lost Rivers Hospital
Blackfoot: Bingham Memorial Hospital
Bonners Ferry: Boundary Community Hospital
Burley: Cassia Regional Medical Center
Grangeville: Syringa General Hospital
Jerome: St. Benedicts Family Medical Center
Kellogg: Shoshone Medical Center
Ketchum: Wood River Medical Center
Malad: Oneida County Hospital

Cascade: Cascade Medical Center
Cottonwood: St. Mary's Hospital
Council: Council Community
Driggs: Teton Valley Hospital
Emmett: Walter Knox Memorial Hospital
Gooding: Gooding County Memorial Hospital
Salmon: Steele Memorial Hospital
Soda Springs: Caribou Memorial Hospital
McCall: McCall Memorial Hospital
Montpelier: Bear Lake Memorial Hospital
Moscow: Gritman Medical Center
Mountain Home: Elmore Medical Center
Orofino: Clearwater Valley Hospital
Rupert: Minidoka Memorial Hospital
St. Maries: Benewah Community Hospital

Variables used in the analysis are defined in Appendix A, but briefly they include the following:

Total Margin
Total Expenses
Cash Flow Margin
Outpatient Revenues to Total Revenues
Total Full-Time Employees Paid
FTE in SNF & Home Health Agency
Total FTE Less SNF & HHA
Salaries to Total Expenses
Deductions and Allowances as Percent of Gross Patient Revenues
FTE's per Adjusted Occupied Bed
Total Inpatient Days
Medicare Inpatient Days
Non-Medicare Inpatient Days
Gross Total Patient Revenues
Medicare Inpatient Payer Mix
Medicare Outpatient Payer Mix
Medicare Outpatient Cost to Charge
Average Daily Census Acute Beds
Average Daily Census Swing-SNF Beds
Average Daily Census Total
Fund Balance
Total General Fund Balance
General Fund Total Assets
Total Assets
Cash
Days Cash on Hand

These are many of the same variables used by the North Carolina researchers to analyze the behavior of Critical Access Hospitals state-by-state, across the entire country.

The basic question we address is whether Critical Access Hospitals with Long-Term Care units are in any way different from Critical Access Hospitals (CAHs) without Long-Term Care (LTC) units. We approach this more as an economic question than as a clinical question. It is true that clinical or operational practices require that standards be met, but we want to analyze the data more from the economic than the clinical point of view. In this analysis, we want to investigate a series of questions such as:

When CAHs with LTC units are compared to CAHs without LTC units do they:

1) Have higher or lower "profit" margins?
2) Have more employees?
3) Have more or fewer employees per occupied bed?
4) Have a different salary structure?

These kinds of questions are getting at a description of the hospital's operations with the intent of discovering the differences in daily operations associated with the existence of an LTC unit. In addition, we are interested

in how the existence of an LTC unit may have affected the behavior of a hospital after it made the transition to a CAH. This involves such questions as: As hospitals became CAH, did hospitals with LTC units:

1) Become more profitable?
2) Hire more employees?
3) Increase employee salaries?
4) Change their inpatient/outpatient mix?

A list of Idaho's twenty-seven CAH hospitals follows. For each hospital we also include information on the number of years of data prior to becoming a CAH, the number of years of data after becoming a CAH, whether the hospital has an LTC, and the average of the hospital's plant.

Table 1. The List of Idaho Hospitals Included in the Study		Years Before CAH	Years as CAH	LTC	Average Age of Plant
Hospitals With	COUNCIL COMMUNITY HOSPITAL[1]	4	2	N	20.89
Long-Term Care	BEAR LAKE MEMORIAL HOSPITAL	4	2	Y	7.09
	BOUNDARY COMMUNITY HOSPITAL	3	3	Y	6.31
	CARIBOU MEMORIAL HOSPITAL	4	3	Y	14.14
	ELMORE MEDICAL CENTER	4	3	Y	9.60
	HARMS MEMORIAL HOSPITAL	3	4	Y	14.07
	MINIDOKA MEMORIAL HOSPITAL	6	2	Y	12.69
	ONEIDA COUNTY HOSPITAL	3	4	Y	9.15
	ST. BENEDICTS FAMILY MED CTR	4	3	Y	18.83
	BINGHAM MEMORIAL HOSPITAL	7	0	Y	8.33
	FRANKLIN COUNTY MEDICAL CENTER	7	0	Y	7.47
	LOST RIVERS HOSPITAL	7	0	Y	10.78
Hospitals Without	BENEWAH COMMUNITY HOSPITAL	5	1	N	6.29
Long-Term Care	CASCADE MEDICAL CENTER	4	3	N	12.42
	GOODING COUNTY MEMORIAL HOSPITAL	3	4	N	9.01
	MCCALL MEMORIAL HOSPITAL	5	3	N	4.90
	STEELE MEMORIAL HOSPITAL	4	3	N	12.90
	SYRINGA GENERAL HOSPITAL	5	2	N	9.31
	TETON VALLEY HOSPITAL	5	2	N	3.70
	WALTER KNOX MEMORIAL HOSPITAL	6	2	N	8.49
	WEISER MEMORIAL HOSPITAL	3	3	N	8.58
	CASSIA REGIONAL MED. CENTER	8	0	N	10.94
	CLEARWATER VALLEY HOSPITAL	7	0	N	2.23
	GRITMAN MEDICAL CENTER	7	0	N	11.66
	ST. MARYS HOSPITAL	6	0	N	13.26
Hospitals That Drop	WOOD RIVER MEDICAL CENTER[2]	7	0	N	1.50
Long-Term Care	SHOSHONE MEDICAL CENTER[2]	4	3	N	11.60

Notes: (1) Council Community Hospital was reported as having a SNF in the Cost Reports

(2) Both Wood River Medical Center and Shoshone Medical Center are shown in the Cost Reports as dropping their SNF when they became CAH

Source: Hospital Cost Report.

The data we are using are from the Medicare Hospital Cost Reports. We had access to data from 1995 through the data available as of March 2004. For some hospitals the most current data included their fiscal year ending in 2004. For other hospitals the most current data were for prior years, as dated as their 2002 fiscal year. We have excluded from the data those reports for partial years. We have categorized the hospitals according to whether or not they have a Long-Term Care (LTC) unit. We have also categorized the annual

reports according to whether the hospital was a Critical Access Hospital (CAH) or not. For example, for one hospital we have six full years of data. For four of those years it was not a CAH and for the last two years it was.

There are seven hospitals that did not become CAHs until 2005 and, therefore, were not a CAH during any of the years reported in the Cost Reports. In addition, there were two hospitals that dropped long-term care. For the analyses of comparing hospitals pre- and post-CAH, these nine hospitals were excluded.

RESULTS

In the following analysis we have used a number of tables to compare hospitals. In order to not reveal the names and financial status of any hospital, each one has been given a random number. Only the status of hospitals with an LTC unit and hospitals without an LTC unit has been preserved. There is no relation to the number assigned to any hospital and the order in which they appear in any of the preceding or following tables.

I. Are hospitals with Long-Term Care units more profitable than hospitals without?

The single most-asked question has to do with hospital profitability. Are large hospitals more profitable than small ones? Does CAH status make a hospital more or less profitable? Does an LTC unit contribute to profitability? We will start with this question.

Table 2 identifies the Total Margin of each hospital before and after becoming a CAH.

Table 2		Total Margin		
		Before CAH	After CAH	Difference
Hospitals With	**7**	1.49%	1.92%	0.43%
Long-Term Care	**9**	2.44%	0.13%	-2.31%
	10	-2.28%	-5.01%	-2.73%
	12	-12.49%	13.55%	26.04%
	14	-1.19%	1.57%	2.76%
	15	2.18%	2.63%	0.45%
	16	-3.99%	-9.30%	-5.31%
	17	6.14%	4.90%	-1.24%
	18	2.35%	8.46%	6.12%
Hospitals Withou	**1**	12.69%	15.77%	3.09%
Long-Term Care	**2**	-5.09%	2.98%	8.06%
	3	1.43%	1.71%	0.28%
	4	16.48%	14.52%	-1.97%
	5	-1.65%	3.50%	5.16%
	6	4.35%	1.77%	-2.58%
	8	7.35%	7.48%	0.14%
	11	-0.23%	2.80%	3.03%
	13	-1.74%	-4.33%	-2.58%
Statistics	MEDIAN W/LTC	1.49%	1.92%	0.43%
	MEDIAN W/O LTC	1.43%	2.98%	0.28%
	SUM OF RANKINGS W/LTC	76	73	82
	SUM OF RANKINGS W/O LTC	95	98	89
	MANN-WHITNEY U-TEST W/LTC	50	53	44
	MANN-WHITNEY U-TEST W/O LTC	31	28	37
Source: Hospital Cost Report.				

Total Margin is defined as Net Income as a percent of Total Revenues. Net Income is calculated as:

Total Patient Revenues
  Less Contractual Allowances and Discounts on Patients' Accounts
= Net Patient Revenues
  Less Operating Expenses
= Net Income from Service to Patients
  Plus Total Other Income
  Less Other Expenses
= Net Income (or Loss)

Total Revenue is calculated as:
Total Patient Revenues plus Total Other Income

In the table, the Total Margin "Before CAH" for each hospital is the average margin for all pre-CAH years. The Total Margin "After CAH" is the average margin for all years for which the hospital had CAH status. The "Difference" is the difference, "After CAH" less "Before CAH", measured in percentage points.

For example: The hospital designated as #7 shows a 1.49% Total Margin in the years before becoming a CAH and a 1.92% Total Margin for the years after becoming a CAH. The column labeled "Difference" is

simply the percentage point difference between 1.49% and 1.92%, i.e. 0.43. The same interpretation applies to all hospitals.

One is struck with the variability in the numbers in each of the categories. For example, for all hospitals with LTC units, prior to becoming a CAH the Total Margins range from -12.49% to +6.14%. The average is -0.59%, dominated by the -12.49%. The variability can be measured with the standard deviation which, in this case, is 5.38, nine times greater than the mean.

Do hospitals with LTC units have higher or lower Total Margins than hospitals without LTC units? Both before and after becoming a CAH, hospitals without LTC units have a higher average Total Margin than those hospitals with LTC units. The sample is small and the averages are dominated by the extreme values, both high and low. Consequently, a better measure of central tendency is the median rather than the mean (average). The median value is that number in a series for which half of the numbers are greater and half of the numbers are smaller.

Table 3 shows that part of Table 2 that has the median Total Margins for hospitals with and without LTC units, and before and after becoming a CAH. Prior to becoming a CAH the median Total Margin for these hospitals was 1.49%. After becoming a CAH, the median Total Margin was 1.92%. For hospitals without LTC units, the median values for Total Margin before and after CAH were 1.43% and 2.98%. The median increase for hospitals with LTC was 0.43 percentage points and for those without LTC, it was 0.28 percentage points.

That the median "Difference" for hospitals with LTC units (i.e. 0.43) is equal to the difference between the "Before CAH" median and the "After CAH" median is purely coincidental. The median change is the median of the changes and not the difference in the two medians, i.e., it is the median of the differences rather than the difference of the medians.

To determine if an LTC unit makes hospitals more profitable, we are asking if the median Total Margin of 1.49% is significantly different from the median Total Margin of 1.43% for non-CAH hospitals, and if the median Total Margin of 1.92% is different from the median Total Margin of 2.98% for CAH hospitals. (Refer to Table 3 below.) We can also ask the question: Did becoming a CAH have a larger or smaller impact on hospitals with a long-term care unit? In this case we are asking if the median Difference of a 0.43 percentage point increase for hospitals with LTC is significantly different from the median Difference of a 0.28 point increase for hospitals without LTC.

Table 3

Total Margin	Before CAH	After CAH	Difference
MEDIAN W/LTC	1.49%	1.92%	0.43%
MEDIAN W/O LTC	1.43%	2.98%	0.28%

These are statistical questions and a statistical technique for comparing medians is the non-parametric test called the Mann-Whitney U Test. A series (e.g., Total Margin for all hospitals before becoming a CAH) is

ranked from highest to lowest. The series is then divided into the two subgroups (e.g. those with an LTC unit and those without). The original rankings are now the basis for comparison of the two groups. If all the high rankings are found in hospitals with an LTC unit and all the low rankings are found in hospitals without an LTC unit, the summation of the rankings will be dramatically different for the two groups. On the other hand, if the rankings are randomly distributed between those with and without an LTC unit, the summation of the rankings will be similar. The calculation of the Mann-Whitney U value is more than a simple summation of rankings, and we won't get into the details. Suffice it to say that for a sample of this size, nine hospitals with LTC units and nine hospitals without, at the 95% level of significance, the critical U value is 17. At that value or at any lower value, the medians of the two groups are significantly different. At any higher value, the medians are not significantly different.

In comparing Total Margins for these eighteen hospitals, with and without an LTC unit, and before and after becoming CAHs we refer to Table 3a below. For these hospitals, prior to becoming CAHs, the U-Values are 50 for hospitals with an LTC unit and 31 for hospitals without an LTC. Statistically this means that there was no significant difference in the Total Margins earned by these hospitals before they became a CAH and after they became a CAH.

After becoming CAHs the U-Values are 53 for hospitals with an LTC unit and 28 for hospitals without one. Again, the Total Margins of hospitals with and without LTC units are not significantly different after they become a CAH.

Table 3a

Total Margin	Before CAH	After CAH	Difference
MEDIAN W/LTC	1.49%	1.92%	0.43%
MEDIAN W/O LTC	1.43%	2.98%	0.28%
SUM OF RANKINGS W/LTC	76	73	82
SUM OF RANKINGS W/O LTC	95	98	89
MANN-WHITNEY U-TEST W/LTC	50	53	44
MANN-WHITNEY U-TEST W/O LTC	31	28	37

The comparison of the Total Margins proceeds in this fashion.

- Prior to becoming a CAH
  - U-Value for hospitals with LTC units = 50
  - U-Value for hospitals without LTC units = 31
  - At the 95% level of confidence there is no significant difference between the Total Margins for the two types of hospitals.
- After becoming a CAH
  - U-Value for hospitals with LTC units = 53
  - U-Value for hospitals without LTC units = 28
  - At the 95% level of confidence there is no significant difference between the Total Margins for the two types of hospitals.
- The median increase/decrease in Total Margins associated with becoming a CAH is .43 percentage points for hospitals with LTC units and .28 percentage points for hospitals without LTC units.

- The U-Value for these "Differences" for hospitals with LTC units = 44.
- The U-Value for these "Differences" for hospitals without LTC units = 37.
- At the 95% level of confidence there is no significant difference in Total Margins that can be associated with becoming a CAH.

An excellent explanation of the derivation and use of the Mann-Whitney U-Test can be found in Groebner, David F., Patrick W. Shannon, Phillip C. Fry, Kent D. Smith, Business Statistics: A Decision-Making Approach, updated 6th edition, Pearson/Prentice-Hall, pp. 675-80.

It matters not that the median Total Margin for CAHs with long-term care units is 1.92% and for CAHs without long-term care units is 55% higher at 2.98%. There is so much variation in the data that a median Total Margin of 2.98% is not significantly different from a median Total Margin of 1.92%. Inspection of Table 2 shows how much variation there is among hospitals and Table 4 summarizes the variability for hospitals with LTC units.

Table 4	Variability for Hospitals with LTC Units	
	Before CAH	After CAH
Maximum	6.14%	13.55%
Minimum	-12.49%	-9.30%
Average	-0.59%	2.09%
Std Deviation	5.38%	6.75%
Std Deviation/Average	9.05	3.22

Prior to becoming CAHs, Total Margins range from a maximum of 6.14% to a low of -12.49%. The average is -0.59% and the standard deviation is 5.38% which is 9.05 times greater than the average.

The conclusion is easy to make. Using the Mann-Whitney U-Test, it appears that an LTC unit does not affect the Total Margin of Idaho CAHs. In fact, regardless of the numerical differences in the medians pre-CAH vs. post-CAH, with LTC vs. without LTC, there is no significant difference in Total Margins.

There is a caveat though. When we ask if the existence of an LTC unit affects Total Margins, we must hold everything except the LTC unit constant. That can be difficult if not impossible. When hospital #12 became a CAH, Total Margins changed dramatically. According to the Cost Report, there was a simultaneous but unrelated large increase in Other Revenue (other than patient revenue). Therefore, any change in profitability cannot be entirely attributed to becoming a CAH or to the existence of an LTC unit.

At the time that Council Community Hospital became a CAH, the Total Margin declined substantially. At the same time Council's largest employer was closing. It might not have been obvious to local citizens as they struggled to keep their hospital open, but the market was not of sufficient size to support even a small hospital. This was not an event caused by or related to becoming a CAH or to the existence of an LTC unit.

When we deal with eighteen small hospitals in eighteen small communities, and if we were to list them by name, it would be easy to identify their peculiar circumstances that explain why things happened the way they

did. It could be a change in hospital ownership, an increase in public monies, or the closure of a major employer. If we were dealing with national data and hundreds of hospitals, what seemed peculiar to one hospital would be shared by many.

Looking at the aggregate data for these small Idaho hospitals, the one conclusion we can support is: There is a great deal of variation in the Total Margins among hospitals, and without considering the peculiar situation of each hospital it is impossible to identify any significant difference between hospitals with LTC units and hospitals without LTC units, nor can any differences be attributed to becoming a CAH. We emphasize this conclusion because it will be repeated time and again as we move through each of the different measures we have chosen.

II. Are hospitals with LTC units larger or smaller than hospitals without?

We can address this question by looking at the number of patients and the number of full-time equivalent employees (FTEs). Table 5 summarizes the data on Average Daily Patient Census and Table 6 summarizes the data for Employment.

Table 5.		Average Daily Census Acute Beds			Average Daily Census Swing-SNF Beds		
		Before CAH	After CAH	Difference	Before CAH	After CAH	Difference
Hospitals With	**7**	3.348	3.652	0.30	1.5	1.0	-0.46
Long-Term Care	**9**	1.244	1.512	0.27	1.0	0.6	-0.42
	10	2.421	1.516	-0.91	0.3	0.4	0.16
	12	1.172	0.541	-0.63	1.0	1.0	-0.01
	14	5.784	4.948	-0.84	0.0	0.2	0.18
	15	8.554	6.645	-1.91	1.0	1.2	0.18
	16	0.500	0.258	-0.24	0.2	0.0	-0.17
	17	8.364	5.816	-2.55	0.0	0.2	0.16
	18	2.585	2.484	-0.10	0.1	0.2	0.09
Hospitals Withou	**1**	3.429	3.332	-0.10	0.5	0.3	-0.21
Long-Term Care	**2**	3.003	2.343	-0.66	0.1	0.3	0.20
	3	2.800	3.041	0.24	0.9	1.1	0.18
	4	3.837	3.796	-0.04	0.3	0.2	-0.11
	5	2.738	3.262	0.52	1.1	0.7	-0.43
	6	4.694	3.090	-1.60	0.1	0.1	0.06
	8	3.299	3.522	0.22	1.0	1.3	0.23
	11	0.619	0.221	-0.40	0.8	0.1	-0.77
	13	5.089	3.438	-1.65	0.0	0.3	0.29
Statistics	MEDIAN W/LTC	2.585	2.484	(0.630)	0.266	0.430	0.090
	MEDIAN W/O LTC	3.299	3.262	(0.098)	0.483	0.307	0.065
	SUM OF RANKINGS W/LTC	81	86	76	85	86	82
	SUM OF RANKINGS W/O LTC	90	85	95	85	85	89
	MANN-WHITNEY U-TEST W/LTC	45	40	50	41	40	44
	MANN-WHITNEY U-TEST W/O LTC	36	41	31	41	41	37

Source: Hospital Cost Report.

The Average Daily Census Swing-SNF Beds refers only to swing Skilled Nursing Facility (SNF) bed usage and does not include the LTC units in those hospitals that have them. Given these definitions, it is not surprising that patient census numbers show no significant difference among hospitals. The critical value for the Mann-Whitney U-Test is 17 and all values are well above that. With and without LTC units, before and after becoming a CAH, the number of patients in acute beds or swing beds shows no significant variation. These are small hospitals in small communities and to a great extent they all look alike.

The data for hospital employment are reported differently than for the census of patients. We have data for Total Full-Time Employees Paid and employees in SNFs & Home Health Agencies (HHA). Total Full-Time Employees Paid has a U-Value of 11 "Before CAH" and a U-Value of 17 "After CAH." This means that Total Full-Time employment in hospitals with LTC units is significantly higher than for hospitals without and, as one would hope, it appears attributable to employment in the LTC unit and/or the HHA.

Table 6		Total Full-Time Employees Paid			SNF & Home Health Agency		
		Before CAH	After CAH	Difference	Before CAH	After CAH	Difference
Hospitals With	**7**	113.76	136.89	23.13	86.77	118.35	31.58
Long-Term Care	**9**	77.00	83.25	6.25	4.48	-9.72	-14.20
	10	127.53	131.77	4.24	50.49	41.52	-8.98
	12	81.67	91.91	10.25	29.73	34.90	5.18
	14	153.07	131.72	-21.35	57.27	37.81	-19.45
	15	196.69	174.24	-22.45	149.36	114.55	-34.81
	16	44.63	34.54	-10.09	-88.45	-84.11	4.34
	17	132.77	137.55	4.78	89.77	90.80	1.03
	18	83.45	93.66	10.21	-34.90	-0.56	34.34
Hospitals Withou	**1**	58.69	61.41	2.71	-45.04	-44.45	0.60
Long-Term Care	**2**	69.67	66.65	-3.02	48.40	44.09	-4.31
	3	72.63	77.86	5.23	16.67	8.23	-8.44
	4	61.41	69.53	8.12	0.00	0.00	0.00
	5	67.86	72.26	4.40	6.57	-8.12	-14.69
	6	103.74	105.85	2.11	56.59	42.35	-14.24
	8	58.37	69.80	11.43	0.16	0.74	0.58
	11	21.26	26.94	5.68	-32.60	-30.12	2.48
	13	61.30	101.94	40.64	1.63	43.44	41.81
Statistics	MEDIAN W/LTC	113.76	131.72	4.78	50.49	37.81	1.03
	MEDIAN W/O LTC	61.41	69.80	5.23	1.63	0.74	0.00
	SUM OF RANKINGS W/LTC	115	112	80	102	95	88
	SUM OF RANKINGS W/O LTC	56	59	91	69	76	83
	MANN-WHITNEY U-TEST W/LTC	11	14	46	24	31	38
	MANN-WHITNEY U-TEST W/O LTC	70	67	35	57	50	43

Source: Hospital Cost Reports

III. Do hospitals with LTC units vary according to Medicare Patient Days and Non-Medicare Inpatient Days?

Table 7 shows that these hospitals are not significantly different with respect to Medicare Inpatient Days or Non-Medicare Inpatient Days. Under the assumption that inpatient days do not include long-term care, this too is not surprising. These are small hospitals in small communities, and their markets do not vary much in size as measured by population. Also, these are Critical Access Hospitals where the number of beds is limited by law. The number of beds will not show much variation, and therefore the number of patient days will not show much variation either.

Table 7		Medicare Inpatient Days			Non-Medicare Inpatient Days		
		Before CAH	After CAH	Difference	Before CAH	After CAH	Difference
Hospitals With	**7**	870.5	1,092.5	222.00	1030.00	755.50	-274.50
Long-Term Care	**9**	617.3	530.5	-86.83	255.67	278.00	22.33
	10	748.3	498.3	-250.00	415.00	403.67	-11.33
	12	315.0	506.0	191.00	495.67	107.00	-388.67
	14	1,003.0	971.7	-31.33	1516.50	1227.00	-289.50
	15	1,890.0	2,003.5	113.50	1859.50	1060.50	-799.00
	16	136.3	48.5	-87.75	108.25	20.00	-88.25
	17	1,799.5	1,225.0	-574.50	1395.50	1209.33	-186.17
	18	490.8	574.7	83.92	572.50	497.67	-74.83
Hospitals Withou	**1**	941.0	847.5	-93.50	605.40	544.50	-60.90
Long-Term Care	**2**	641.7	599.7	-42.00	604.33	463.67	-140.67
	3	821.6	997.0	175.40	612.80	593.67	-19.13
	4	907.4	860.0	-47.40	730.40	735.33	4.93
	5	1,157.7	1,194.5	36.83	256.33	271.00	14.67
	6	738.2	549.0	-189.20	1132.00	733.00	-399.00
	8	1,155.8	1,276.0	120.20	492.80	545.50	52.70
	11	132.0	56.7	-75.33	923.50	686.33	-237.17
	13	1,375.0	965.7	-409.33	583.75	463.67	-120.08
Statistics	MEDIAN W/LTC	748.33	574.67	-31.33	572.50	497.67	-186.17
	MEDIAN W/O LTC	907.40	860.00	-47.40	605.40	545.50	-60.90
	SUM OF RANKINGS W/LTC	80	80	90	85	86	72
	SUM OF RANKINGS W/O LTC	91	91	81	86	84	99
	MANN-WHITNEY U-TEST W/LTC	46	46	36	41	40	54
	MANN-WHITNEY U-TEST W/O LTC	35	35	45	40	42	27

Source: Hospital Cost Reports

IV. Do hospitals with LTC units have a higher ratio of Salaries to Total Expenses and/or a higher number of FTEs per Adjusted Occupied Bed than hospitals without LTC units?

Table 8 shows that for both types of hospital and both before and after becoming a CAH, there is no significant difference in the ratios of Salaries to Total Expenses and in the number of Full-time Equivalent employees (FTEs) per Adjusted Occupied Bed.

Table 8.		FTE's per Adjusted Occupied Bed			FTE's per Adjusted Occupied Bed		
		Before CAH	After CAH	Difference	Before CAH	After CAH	Difference
Hospitals With	**7**	19.61	23.12	3.5	19.61	23.12	3.5
Long-Term Care	**9**	31.92	29.38	(2.5)	31.92	29.38	(2.5)
	10	31.83	59.55	27.7	31.83	59.55	27.7
	12	39.78	110.24	70.5	39.78	110.24	70.5
	14	17.16	16.13	(1.0)	17.16	16.13	(1.0)
	15	14.42	16.86	2.4	14.42	16.86	2.4
	16	53.93	71.86	17.9	53.93	71.86	17.9
	17	10.95	14.42	3.5	10.95	14.42	3.5
	18	18.73	21.06	2.3	18.73	21.06	2.3
Hospitals Withou	**1**	14.54	16.17	1.6	14.54	16.17	1.6
Long-Term Care	**2**	18.02	22.44	4.4	18.02	22.44	4.4
	3	19.54	21.37	1.8	19.54	21.37	1.8
	4	14.73	16.70	2.0	14.73	16.70	2.0
	5	20.44	21.35	0.9	20.44	21.35	0.9
	6	20.85	31.23	10.4	20.85	31.23	10.4
	8	13.55	17.02	3.5	13.55	17.02	3.5
	11	34.33	102.08	67.8	34.33	102.08	67.8
	13	11.54	22.49	11.0	11.54	22.49	11.0
Statistics	MEDIAN W/LTC	19.61	23.12	3.5	19.61	23.12	3.5
	MEDIAN W/O LTC	18.02	21.37	3.5	18.02	21.37	3.5
	SUM OF RANKINGS W/LTC	96	89	87	96	89	87
	SUM OF RANKINGS W/O LTC	75	82	84	75	82	84
	MANN-WHITNEY U-TEST W/LTC	30	37	39	30	37	39
	MANN-WHITNEY U-TEST W/O LTC	51	44	42	51	44	42

Source: Hospital Cost Reports.

V. Do hospitals with long-term care units have greater Gross Total Patient Revenues and greater Total Expenses than hospitals without long-term care units?

Again, the data (Table 9) suggest that there are no significant differences in Gross Total Patient Revenues that can be associated with LTC units. The same can be said for Total Expenses.

Table 9.		Gross Total Patient Revenues			Total Expenses		
		Before CAH	After CAH	Difference	Before CAH	After CAH	Difference
Hospitals With	**7**	$ 6,164,372	$ 11,606,717	$ 5,442,345	$ 5,509,241	$ 9,235,754	$ 3,726,513
Long-Term Care	**9**	$ 3,883,839	$ 4,986,772	$ 1,102,934	$ 3,348,364	$ 4,300,094	$ 951,730
	10	$ 6,638,962	$ 7,205,222	$ 566,260	$ 5,414,221	$ 6,879,560	$ 1,465,339
	12	$ 3,699,727	$ 3,614,415	$ (85,312)	$ 3,981,256	$ 3,997,086	$ 15,830
	14	$ 16,108,178	$ 14,673,718	$ (1,434,460)	$ 11,683,373	$ 11,491,865	$ (191,507)
	15	$ 15,262,201	$ 17,710,591	$ 2,448,391	$ 11,237,913	$ 13,888,468	$ 2,650,555
	16	$ 2,479,768	$ 1,182,443	$ (1,297,326)	$ 2,080,532	$ 1,322,866	$ (757,666)
	17	$ 11,118,507	$ 13,579,988	$ 2,461,482	$ 8,349,437	$ 11,412,432	$ 3,062,996
	18	$ 5,004,027	$ 7,771,027	$ 2,767,000	$ 4,394,997	$ 6,309,333	$ 1,914,337
Hospitals Withou	**1**	$ 6,206,391	$ 9,224,632	$ 3,018,241	$ 4,382,079	$ 5,664,935	$ 1,282,856
Long-Term Care	**2**	$ 4,816,561	$ 6,036,592	$ 1,220,032	$ 3,872,042	$ 4,883,606	$ 1,011,564
	3	$ 4,768,449	$ 6,651,098	$ 1,882,648	$ 4,274,355	$ 6,280,928	$ 2,006,573
	4	$ 6,446,204	$ 9,158,441	$ 2,712,237	$ 5,636,919	$ 8,039,201	$ 2,402,281
	5	$ 5,112,942	$ 7,426,321	$ 2,313,379	$ 4,302,876	$ 5,585,361	$ 1,282,485
	6	$ 10,420,237	$ 12,799,767	$ 2,379,530	$ 8,053,767	$ 10,327,999	$ 2,274,232
	8	$ 4,310,587	$ 6,389,420	$ 2,078,833	$ 3,697,057	$ 5,596,577	$ 1,899,519
	11	$ 1,253,940	$ 1,567,218	$ 313,279	$ 1,296,661	$ 1,856,283	$ 559,622
	13	$ 3,414,776	$ 7,482,884	$ 4,068,108	$ 3,237,314	$ 6,992,656	$ 3,755,343
Statistics	MEDIAN W/LTC	$ 6,164,372	$ 7,771,027	$ 1,102,934	$ 5,414,221	$ 6,879,560	$ 1,465,339
	MEDIAN W/O LTC	$ 4,816,561	$ 7,426,321	$ 2,313,379	$ 4,274,355	$ 5,664,935	$ 1,899,519
	SUM OF RANKINGS W/LTC	96	92	75	100	94	79
	SUM OF RANKINGS W/O LTC	75	79	96	71	77	92
	MANN-WHITNEY U-TEST W/LTC	30	34	51	26	32	47
	MANN-WHITNEY U-TEST W/O LTC	51	47	30	55	49	34

Source: Hospital Cost Reports.

VI. Do hospitals with long-term care units have a greater Cash Flow Margin and a larger number of Days Cash on Hand than hospitals without long-term care units?

Cash Flow Margin is defined as net income less income from contributions, investments, and appropriations plus depreciation and interest expense divided by total patient revenue less income from contributions, investments, and appropriations. It measures the cash flow from providing services to patients. A higher cash flow is a measure of the hospital's strength.

Days Cash on Hand measures the number of days the hospital could meet its expenses with current cash holdings. In the calculation of Days Cash on Hand, negative values were omitted.

And again, there are no significant differences between hospitals with and without LTC units and before and after attaining CAH status.

Table 10.		Cash Flow Margin			Days Cash on Hand		
		Before CAH	After CAH	Difference	Before CAH	After CAH	Difference
Hospitals With	**7**	6.03%	8.42%	2.4%	91.95	64.68	(27.28)
Long-Term Care	**9**	5.62%	4.84%	-0.8%	50.55	42.44	(8.11)
	10	3.60%	1.48%	-2.1%	62.52	12.31	(50.21)
	12	-28.82%	11.39%	40.2%	10.02	59.78	49.76
	14	3.56%	5.61%	2.0%	11.47	1.92	(9.54)
	15	3.91%	8.32%	4.4%	33.80	49.46	15.67
	16	-9.26%	-8.35%	0.9%	25.91	43.01	17.10
	17	2.61%	4.18%	1.6%	83.90	99.05	15.15
	18	5.49%	8.67%	3.2%	80.17	69.26	(10.91)
Hospitals Withou	**1**	14.62%	10.16%	-4.5%	138.15	83.44	(54.71)
Long-Term Care	**2**	0.88%	5.09%	4.2%	54.98	11.34	(43.63)
	3	8.45%	11.72%	3.3%	25.06	37.64	12.58
	4	4.05%	2.27%	-1.8%	249.46	309.58	60.12
	5	1.20%	10.21%	9.0%	11.00	33.81	22.81
	6	8.18%	-0.36%	-8.5%	90.08	70.17	(19.91)
	8	5.05%	7.19%	2.1%	167.58	139.71	(27.87)
	11	-19.01%	-8.50%	10.5%	17.71	37.49	19.78
	13	-0.18%	-1.24%	-1.1%	148.80	25.58	(123.22)
Statistics	MEDIAN W/LTC	3.60%	5.61%	2.0%	50.55	49.46	(8.11)
	MEDIAN W/O LTC	4.05%	5.09%	2.1%	90.08	37.64	(19.91)
	SUM OF RANKINGS W/LTC	80	88	89	72	83	92
	SUM OF RANKINGS W/O LTC	91	83	82	99	88	79
	MANN-WHITNEY U-TEST W/LTC	46	38	37	54	43	34
	MANN-WHITNEY U-TEST W/O LTC	35	43	44	27	38	47

Source: Hospital Cost Reports.

VII. Are there any significant differences with respect to the Total General Fund Balance and Cash Balances?

Again, the data suggest that there are no significant differences (Table 11).

Table 11.		Total General Fund Balance			Cash		
		Before CAH	After CAH	Difference	Before CAH	After CAH	Difference
Hospitals With	**7**	$ 5,410,134	$ 7,267,573	34.3%	$ 458,859	$ 1,195,111	160.5%
Long-Term Care	**9**	$ 867,059	$ 1,233,979	42.3%	$ 438,375	$ 386,805	-11.8%
	10	$ 6,954,858	$ 5,238,058	-24.7%	$ 693,882	$ 211,565	-69.5%
	12	$ 236,410	$ 1,361,927	476.1%	$ 106,234	$ 646,839	508.9%
	14	$ 2,721,893	$ 3,144,456	15.5%	$ 354,127	$ 58,573	-83.5%
	15	$ 4,965,379	$ 5,544,736	11.7%	$ 374,918	$ 1,786,180	376.4%
	16	$ 238,678	$ 73,795	-69.1%	$ 110,906	$ 210,771	90.0%
	17	$ 7,349,205	$ 8,116,663	10.4%	$ 1,820,811	$ 2,894,709	59.0%
	18	$ 2,734,249	$ 3,668,052	34.2%	$ 709,079	$ 706,009	-0.4%
Hospitals Withou	**1**	$ 4,195,045	$ 7,371,503	75.7%	$ 906,155	$ 441,608	-51.3%
Long-Term Care	**2**	$ 1,986,149	$ 1,455,289	-26.7%	$ 409,121	$ 144,550	-64.7%
	3	$ 2,946,231	$ 3,512,010	19.2%	$ 188,354	$ 583,261	209.7%
	4	$ 8,785,995	$ 13,890,431	58.1%	$ 2,924,415	$ 6,172,079	111.1%
	5	$ 794,675	$ 1,643,325	106.8%	$ 125,190	$ 490,173	291.5%
	6	$ 4,631,447	$ 5,585,751	20.6%	$ 1,107,811	$ 1,394,445	25.9%
	8	$ 4,138,475	$ 5,798,151	40.1%	$ 1,149,180	$ 876,547	-23.7%
	11	$ 456,511	$ 404,781	-11.3%	$ 61,377	$ 182,682	197.6%
	13	$ 3,885,305	$ 2,935,444	-24.4%	$ 260,516	$ 239,873	-7.9%
Statistics	MEDIAN W/LTC	$ 2,734,249	$ 3,668,052	15.5%	$ 438,375	$ 646,839	59.0%
	MEDIAN W/O LTC	$ 3,885,305	$ 3,512,010	20.6%	$ 409,121	$ 490,173	25.9%
	SUM OF RANKINGS W/LTC	85	81	80	83	87	86
	SUM OF RANKINGS W/O LTC	86	90	91	88	84	85
	MANN-WHITNEY U-TEST W/LTC	41	45	46	43	39	40
	MANN-WHITNEY U-TEST W/O LTC	40	36	35	38	42	41

Source: Hospital Cost Reports.

VIII. Are there any significant differences with respect to total General Fund Assets and Total Assets?

Again, no significant differences are detected (Table 12).

Table 12		Gen Fund Total Assets			Total Assets		
		Before CAH	After CAH	Difference	Before CAH	After CAH	Difference
Hospitals With	**7**	$ 7,249,014	$ 9,607,913	32.5%	$ 7,249,014	$ 9,607,913	32.5%
Long-Term Care	**9**	$ 2,640,742	$ 2,889,659	9.4%	$ 2,669,470	$ 2,889,659	8.2%
	10	$ 7,464,037	$ 6,220,572	-16.7%	$ 7,465,644	$ 6,220,572	-16.7%
	12	$ 1,270,268	$ 1,807,406	42.3%	$ 1,270,268	$ 1,807,406	42.3%
	14	$ 5,936,748	$ 5,249,102	-11.6%	$ 5,936,748	$ 5,249,102	-11.6%
	15	$ 8,594,863	$ 10,174,108	18.4%	$ 8,594,863	$ 10,174,108	18.4%
	16	$ 852,173	$ 860,572	1.0%	$ 852,173	$ 860,572	1.0%
	17	$ 12,117,017	$ 13,617,295	12.4%	$ 12,117,017	$ 13,617,295	12.4%
	18	$ 4,041,190	$ 4,537,302	12.3%	$ 4,041,190	$ 4,537,302	12.3%
Hospitals Withou	**1**	$ 4,815,280	$ 10,626,989	120.7%	$ 4,815,280	$ 10,626,989	120.7%
Long-Term Care	**2**	$ 3,297,634	$ 3,196,749	-3.1%	$ 3,328,227	$ 3,196,749	-4.0%
	3	$ 5,569,688	$ 6,290,211	12.9%	$ 5,633,426	$ 6,290,211	11.7%
	4	$ 12,440,549	$ 16,605,113	33.5%	$ 12,440,549	$ 16,605,113	33.5%
	5	$ 1,932,257	$ 3,418,630	76.9%	$ 1,932,257	$ 3,418,630	76.9%
	6	$ 9,089,723	$ 9,464,775	4.1%	$ 9,184,394	$ 9,570,000	4.2%
	8	$ 4,630,372	$ 6,478,831	39.9%	$ 4,630,372	$ 6,478,831	39.9%
	11	$ 1,123,801	$ 1,687,014	50.1%	$ 1,123,801	$ 1,687,014	50.1%
	13	$ 4,088,230	$ 8,036,405	96.6%	$ 4,088,230	$ 8,036,405	96.6%
Statistics	MEDIAN W/LTC	$ 5,936,748	$ 5,249,102	12.3%	$ 5,936,748	$ 5,249,102	12.3%
	MEDIAN W/O LTC	$ 4,630,372	$ 6,478,831	39.9%	$ 4,630,372	$ 6,478,831	39.9%
	SUM OF RANKINGS W/LTC	87	78	63	87	78	65
	SUM OF RANKINGS W/O LTC	84	93	108	84	93	106
	MANN-WHITNEY U-TEST W/LTC	39	48	63	39	48	61
	MANN-WHITNEY U-TEST W/O LTC	42	33	18	42	33	20

Source: Hospital Cost Reports.

IX. Are there any significant differences with respect to the Outpatient Revenues as a percent Total Revenues?

The ratio of Outpatient Revenues to Total Revenues for those hospitals without LTC units is significantly higher than those hospitals with LTC units (Table 13). This is to be expected. Hospitals with LTC units will inherently have a relatively larger number of inpatients, a smaller ratio of outpatients, and therefore a lower ratio of Outpatient Revenues to Total Revenues.

Table 13.		Outpatient Revenues to Total Revenues		
		Before CAH	After CAH	Difference
Hospitals With	**7**	42.60%	63.11%	20.5%
Long-Term Care	**9**	45.71%	46.51%	0.8%
	10	41.42%	42.90%	1.5%
	12	39.41%	33.25%	-6.2%
	14	71.98%	49.87%	-22.1%
	15	37.91%	45.47%	7.6%
	16	50.61%	30.72%	-19.9%
	17	51.43%	65.46%	14.0%
	18	34.64%	41.93%	7.3%
Hospitals Withou	**1**	62.44%	81.22%	18.8%
Long-Term Care	**2**	59.52%	69.37%	9.9%
	3	50.13%	50.99%	0.9%
	4	62.60%	65.25%	2.7%
	5	58.56%	70.88%	12.3%
	6	48.91%	55.11%	6.2%
	8	48.83%	51.41%	2.6%
	11	62.90%	71.46%	8.6%
	13	55.83%	58.93%	3.1%
Statistics	MEDIAN W/LTC	42.60%	45.47%	1.5%
	MEDIAN W/O LTC	58.56%	65.25%	6.2%
	SUM OF RANKINGS W/LTC	60	54	73
	SUM OF RANKINGS W/O LTC	111	117	98
	MANN-WHITNEY U-TEST W/LTC	66	72	53
	MANN-WHITNEY U-TEST W/O LTC	15	9	28
Source: Hospital Cost Reports.				

This is "weakly" verified in Table 14 which summarizes the Medicare Inpatient Payer Mix and the Medicare Outpatient Payer Mix. The table summarizes only the Medicare patients, not the total patients, and while there are no significant differences in the Medicare Inpatient Payer Mix, the Medicare Outpatient Mix does show pre-CAH U-Values of 25 and post-CAH U-Values of 27. They are not significant at the 95% level of confidence, but would be at a lower level of significance.

Table 14.		Medicare Inpatient Payer Mix			Medicare Outpatient Payer Mix		
		Before CAH	After CAH	Difference	Before CAH	After CAH	Difference
Hospitals With	**7**	49.10%	63.76%	14.7%	16.49%	29.44%	12.9%
Long-Term Care	**9**	73.90%	68.06%	-5.8%	22.53%	37.56%	15.0%
	10	76.26%	70.12%	-6.1%	27.87%	33.18%	5.3%
	12	39.18%	88.69%	49.5%	16.84%	30.54%	13.7%
	14	47.48%	51.88%	4.4%	10.74%	23.90%	13.2%
	15	53.95%	69.78%	15.8%	19.53%	27.36%	7.8%
	16	55.73%	70.80%	15.1%	39.00%	48.54%	9.5%
	17	58.90%	56.18%	-2.7%	24.48%	28.27%	3.8%
	18	49.35%	58.07%	8.7%	16.99%	32.56%	15.6%
Hospitals Withou	**1**	67.15%	64.45%	-2.7%	29.32%	45.48%	16.2%
Long-Term Care	**2**	56.60%	61.99%	5.4%	24.67%	37.11%	12.4%
	3	60.01%	65.53%	5.5%	18.29%	25.44%	7.1%
	4	59.84%	58.85%	-1.0%	22.28%	34.52%	12.2%
	5	81.99%	82.64%	0.6%	20.71%	43.45%	22.7%
	6	42.51%	46.80%	4.3%	23.52%	32.30%	8.8%
	8	73.03%	73.10%	0.1%	24.73%	34.04%	9.3%
	11	24.79%	52.96%	28.2%	24.33%	28.96%	4.6%
	13	73.26%	70.08%	-3.2%	28.46%	40.15%	11.7%
Statistics	MEDIAN W/LTC	53.95%	68.06%	8.7%	19.53%	30.54%	12.9%
	MEDIAN W/O LTC	60.01%	64.45%	0.6%	24.33%	34.52%	11.7%
	SUM OF RANKINGS W/LTC	75	89	93	70	72	87
	SUM OF RANKINGS W/O LTC	96	82	78	101	99	84
	MANN-WHITNEY U-TEST W/LTC	51	37	33	56	54	39
	MANN-WHITNEY U-TEST W/O LTC	30	44	48	25	27	42

Source: Hospital Cost Reports.

X. Do the hospitals differ by the amount of Deductions and Allowances they allow?

Results show no significant differences between hospitals with LTC units and hospitals without; or for hospitals before they became a CAH and after they became a CAH.

Table 15.		Deductions and Allowances as Percent of Gross Patient Revenues		
		Before CAH	After CAH	Difference
Hospitals With	**7**	13.17%	21.02%	7.8%
Long-Term Care	**9**	17.17%	17.04%	-0.1%
	10	17.75%	10.75%	-7.0%
	12	19.69%	6.37%	-13.3%
	14	29.14%	21.19%	-8.0%
	15	23.18%	21.30%	-1.9%
	16	26.95%	20.21%	-6.7%
	17	29.90%	20.38%	-9.5%
	18	15.67%	15.90%	0.2%
Hospitals Withou	**1**	22.31%	28.37%	6.1%
Long-Term Care	**2**	28.72%	22.88%	-5.8%
	3	14.09%	10.68%	-3.4%
	4	20.67%	10.63%	-10.0%
	5	23.33%	28.77%	5.4%
	6	19.64%	20.50%	0.9%
	8	18.02%	13.07%	-5.0%
	11	19.09%	8.51%	-10.6%
	13	13.80%	14.81%	1.0%
Statistics	MEDIAN W/LTC	19.69%	20.21%	-6.7%
	MEDIAN W/O LTC	19.64%	14.81%	-3.4%
	SUM OF RANKINGS W/LTC	89	86	77
	SUM OF RANKINGS W/O LTC	82	85	94
	MANN-WHITNEY U-TEST W/LTC	37	40	49
	MANN-WHITNEY U-TEST W/O LTC	44	41	32

Source: Hospital Cost Reports.

XI. Conclusions for Univariate Data.

While there are some differences that are statistically significant, the major conclusion is that the two kinds of hospitals, those with and those without LTC units, are very similar to each other. We also conclude that there was no significant difference in performance (as reflected in these measures) between these hospitals as CAHs and the same hospitals before they became CAHs. The preponderance of statistical evidence shows little difference. This may be the profound conclusion that we are searching for. Table 15 summarizes this finding. Where differences do occur they are obviously related to the existence of an LTC unit. Hospitals with LTC units have more employees, those employees are employed in the SNF, and these hospitals have a lower ratio of Outpatient Revenues to Total Revenues. Other than that, these hospitals are very similar.

Table 16. IS THERE A SIGNIFICANT DIFFERENCE BETWEEN HOSPITALS WITH LTC UNITS AND HOSPITALS WITHOUT?

	Before CAH	After CAH	
TOTAL MARGIN	NO	NO	
BEDS			
ACUTE	NO	NO	
TOTAL	NO	NO	
AVERAGE DAILY CENSUS			
ACUTE BEDS	NO	NO	
SWING-SNF BEDS	NO	NO	
TOTAL BEDS	NO	NO	
PATIENT DAYS			
TOTAL INPATIENT	NO	NO	
MEDICARE INPATIENT	NO	NO	
MEDICARE OUTPATIENT	NO	NO	
OUTPATIENT REVENUES TO TOTAL REVENUES	YES	YES	HOSPITALS W/LTC HAVE LOWER OUTPATIENT REVENUES TO TOTAL REVENUES
MEDICARE INPATIENT PAYER MIX	NO	NO	
MEDICARE OUTPATIENT PAYER MIX	NO	NO	
EMPLOYEES			
TOTAL	YES	YES	HOSPITALS W/LTC HAVE MORE EMPLOYEES
SNF & HHA	YES	YES	THE ADDITIONAL EMPLOYEES ARE IN THE SNF AND HHA
OTHER	NO	NO	
SALARIES TO TOTAL EXPENSES	NO	NO	
GROSS PATIENT REVENUES	NO	NO	
TOTAL EXPENSES	NO	NO	
FTE PER ADJUSTED OCCUPIED BED	NO	NO	
CASH FLOW MARGIN	NO	NO	
DAYS CASH ON HAND	NO	NO	
CASH BALANCE	NO	NO	
GENERAL FUND BALANCE	NO	NO	
FUND BALANCE	NO	NO	
GENERAL FUND TOTAL ASSETS	NO	NO	
TOTAL ASSETS	NO	NO	

XII. Using multivariate analysis, is it possible to find a relationship between the existence of an LTC unit and a hospital's Total Margin?

In sections I through XI, we have provided the evidence that hospitals with LTC units are not much different from hospitals without LTC units. The analysis has been what one could call "univariate" in the sense that we are comparing hospitals using one measurement at a time, e.g., Do hospitals with and without LTC units have different Total Margins? What we propose to do in this section is to use multivariate analysis to answer such questions as:

1) Does an LTC unit contribute to the profitability of a hospital?

2) Why do some hospitals have LTC units and some don't?

The hospitals in Table 17 comprise the sample of Idaho hospitals included in this section. The list is further revised to exclude the largest of the small hospitals, i.e., Gritman Medical Center, Cassia Regional Medical Center, and Bingham Memorial. Other hospitals were excluded because of unique circumstances in their communities or counties. Wood River Medical Center was excluded because of its recent move from Hailey to Ketchum. The cost reports associated with Wood River reflected this change and were not comparable to other hospitals that did not share this kind of experience. The hospitals were divided into two subgroups. The first was made up of those hospitals (or counties) that had LTC units as part of the hospital operation. The second group was made up of those counties in which the long-term care was provided by a private entity not owned or administered by the hospital. Teton County was excluded because it did not have an LTC unit run by either the hospital or by a private entity. The final list is found in Table 18.

Table 17. Hospitals Used in Multivariate Analysis

Hospital Name	County
BEAR LAKE MEMORIAL HOSPITAL	BEAR LAKE
BENEWAH COMMUNITY HOSPITAL	BENEWAH
WOOD RIVER MEDICAL CENTER	BLAINE
BOUNDARY COMMUNITY HOSPITAL	BOUNDARY
LOST RIVERS HOSPITAL	BUTTE
CARIBOU MEMORIAL HOSPITAL	CARIBOU
CASSIA REGIONAL MED. CENTER	CASSIA
CLEARWATER VALLEY HOSPITAL	CLEARWATER
FRANKLIN COUNTY MEDICAL CENTER	FRANKLIN
WALTER KNOX MEMORIAL HOSPITAL	GEM
GOODING COUNTY MEMORIAL HOSPITAL	GOODING
SYRINGA GENERAL HOSPITAL	IDAHO
ST. BENEDICTS FAMILY MED CTR	JEROME
GRITMAN MEDICAL CENTER	LATAH
STEELE MEMORIAL HOSPITAL	LEMHI
ST. MARY'S	IDAHO
MINIDOKA MEMORIAL HOSPITAL	MINIDOKA
ONEIDA COUNTY HOSPITAL	ONEIDA
HARMS MEMORIAL HOSPITAL	POWER
SHOSHONE MEDICAL CENTER	SHOSHONE
TETON VALLEY HOSPITAL	TETON
MCCALL MEMORIAL HOSPITAL	VALLEY
CASCADE MEMORIAL HOSPITAL	VALLEY
WEISER MEMORIAL HOSPITAL	WASHINGTON

Table 18

Hospitals With Long-Term Care Units		Hospitals Without Long-Term Care Units	
Hospital Name	County	Hospital Name	County
BEAR LAKE MEMORIAL HOSPITAL	BEAR LAKE	BENEWAH COMMUNITY HOSPITAL	BENEWAH
BOUNDARY COMMUNITY HOSPITAL	BOUNDARY	CLEARWATER VALLEY HOSPITAL	CLEARWATER
LOST RIVERS HOSPITAL	BUTTE	WALTER KNOX MEMORIAL HOSPITAL	GEM
CARIBOU MEMORIAL HOSPITAL	CARIBOU	GOODING COUNTY MEMORIAL HOSPITAL	GOODING
FRANKLIN COUNTY MEDICAL CENTER	FRANKLIN	SYRINGA GENERAL HOSPITAL	IDAHO
ST. MARYS HOSPITAL	IDAHO	STEELE MEMORIAL HOSPITAL	LEMHI
ST. BENEDICTS FAMILY MED CTR	JEROME	SHOSHONE MEDICAL CENTER	SHOSHONE
MINIDOKA MEMORIAL HOSPITAL	MINIDOKA	MCCALL MEMORIAL HOSPITAL	VALLEY
ONEIDA COUNTY HOSPITAL	ONEIDA	WEISER MEMORIAL HOSPITAL	WASHINGTON
HARMS MEMORIAL HOSPITAL	POWER	CASCADE MEMORIAL	VALLEY

From Washington, D.C., it is easy to imagine that all small Idaho counties seem homogenous with small populations, with virtually the same per capita income, and the same demographics. Being familiar with the state, though, it is easy to differentiate Blaine County (Sun Valley) and Valley County (McCall) with high per capita incomes and very little agriculture from Bear Lake County (Montpelier) and Franklin County (Preston) with much lower per capita incomes and a larger agricultural economic base. The counties in the timber and mining areas of the north seem different to us than the counties in the south that are much more dependent on traditional agriculture.

The first question is: How does an LTC facility, owned or administered by the hospital, affect the profitability of the hospital? Multiple regression was used to identify the relationship between Total Margin as the dependent variable with (1) percentage change in the county's per capita income, (2) FTE per bed, (3) distance to the nearest tertiary hospital, (4) percent of the county's population in poverty, and (5) the existence of an LTC unit in the hospital as independent variables.

Dependent Variable: TOTAL MARGIN
Method: Least Squares
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.208124	0.058238	3.573683	0.0028
PCT CHANGE IN PER CAPITA INCOME	-0.249350	0.061917	-4.027167	0.0011
FTE PER BED	-0.000984	0.000378	-2.603479	0.0200
DISTANCE TO TERTIARY HOSPITAL	0.000370	0.000118	3.132425	0.0068
PCT OF POPULATION IN POVERTY	-0.007478	0.002659	-2.811905	0.0131
LTC IN HOSPITAL	-0.030568	0.016808	-1.818606	0.0890
R-squared	0.667613			

Sources: County data on Per Capita Income and Percent of Population in Poverty from Bureau of Economic Analysis.
Total Margin and FTE Per Bed from Medicare Hospital Cost Reports.
LTC in hospital from Idaho Department of Health and Welfare.
Distance to Tertiary Hospital, Idaho State Office of Rural Health.

The above results say:

1. The Total Margin of a hospital is inversely related to the rate of growth in the per capita income of the county. That is, the hospitals in those counties in which per capita income is growing the fastest have lower Total Margins than hospitals in counties where per capita income is growing more slowly.

Possible Explanation: The assumption would be that as income grows, the demand for medical care increases, but patients are more inclined to go out of the county to get that care. There are many citations that show this positive relation between income and medical care. A convenient one is a 1992 article by Joseph Newhouse, "Medical Care Costs: How Much Welfare Loss?" in the Journal of Economic Perspectives, volume 6, number 3, pages 3-21.

2. The Total Margin of the hospital is inversely related to the number of FTE per bed.

Possible Explanation: Those hospitals with more FTE per bed have lower Total Margins than hospitals with lower FTE per bed. This seems an easy conclusion.

3. The Total Margin of the hospital is directly related to the distance to the nearest tertiary care hospital.

Possible Explanation: The farther away from tertiary care, the more likely the population will be to use the local services and thereby contribute to the hospital's profits. Of course the reverse is true. The closer to a tertiary care hospital, the more likely the population will be to buy the care provided by that tertiary care facility.

4. The Total Margin is inversely related to the percent of the county's population living below the poverty level of income.

Possible Explanation: The larger the population, the larger the market, but the greater the percentage of the population in poverty, the weaker the market and the more difficult for the hospital to return a profit, i.e. the larger the amount of charity care.

5. The Total Margin is inversely related to the existence of an LTC unit in the hospital, that is, an LTC unit detracts from the profitability of the hospital.

Possible Explanation: The LTC unit in the hospital may be seen as an essential service that is not being provided by the private sector. The hospital is therefore, "forced" to assume the low margin activity and profit falls.

These conclusions are not meant to be definitive in the sense that other variables do not affect the Total Margin of small, rural hospitals. Neither do we want to imply that all hospitals respond to these variables in exactly the same manner. We are dealing with a sample size of 20-25, in a single state, but the results are statistically significant. When we compared the Total Margin of hospitals with an LTC unit to the Total Margin of hospitals without an LTC unit there was no significant difference. The implication was that an LTC unit does not influence the Total Margin of a hospital. But now, when we consider a more comprehensive model and relate Total Margin simultaneously to per capita income, FTE per bed, distance to the closest tertiary care hospital, the population below poverty, and the existence of an LTC unit, we have evidence (not proof) that an LTC unit has a negative impact on the Total Margin of a small hospital.

XIII. Why do some small hospitals have LTC units and some do not?

With this question we would like to address the further question of why LTC units are sometimes found in hospitals and sometimes provided by the private sector.

For this question we have gathered economic and demographic data on counties and used them in a multiple regression model to identify those economic and/or demographic conditions associated with counties in which LTC units are or are not located in hospitals. The results can be summarized as follows.

Table 19 **Results of Multivariate Regression**

Dependent Variable	Independent Variable	Coefficient	z or t-statistic	Probability of Not Being Significant
EQUATION #1				
LTC Unit in Hospital	Equity Financing	4.623	1.69	0.089
$R^2 = .63$	Number of Private Assisted Living Rooms in County	-0.037	-2.52	0.012
	Population from 18-65	-32.00	-2.31	.02
EQUATION #2				
LTC Unit in Hospital	Equity Financing	3.41	1.86	.06
$R^2 = .63$	Number of Private Assisted Living Rooms in County	-0.03	-2.94	0.0032
	Per Capita Income	-0.000123	-2.00	0.05
EQUATION #3				
Number of LTC Beds in County in Hospital	Number of LTC Beds in County not in Hospital	-0.32	-7.53	0.00
$R^2 = .74$	Per Capita Income	-0.0012	-2.84	.009
	County Population	0.0015	5.52	0.00

Sources: Equity Financing from Hospital Cost Reports.
LTC unit in Hospital Number of Private Assisted Living Rooms, Number of LTC Beds in Hospital, from Idaho Department of Health and Welfare.
County Population from 18-65, County Per Capita Income, and County Population from Bureau of Economic Analysis.

Without getting into great detail, the statistical significance of the equations is measured by the values of the R^2 and the values of the t-statistics. R^2 is the proportion of the total variation in the independent variable that is explained by variation in the set of independent variables. The R^2 value of .63 in the second equation is interpreted as saying that 63% of the total variation in the dependent variable can be explained by variation in Equity Financing (i.e. the value of the hospital's assets less the value of the hospital's debt), the Number of

Private Assisted Living Rooms in the County, and the County's Per Capita Income. Given our experience in statistical estimation, this is a significantly large value. In many instances we have dealt with values well below .50. The t-statistics measure the significance of each coefficient. The 95% confidence level requires that the t-statistic be greater than or equal to 2.

1. Counties with private LTC facilities have larger populations and higher per-capita incomes than counties that have LTC facilities in the hospital. The implications are:

    a. The larger the market, as measured by population and income, the more likely the LTC facility will be provided by the private sector.

    b. People living in wealthier counties, those counties with higher per capita incomes, may have the incentive to seek a more desirable combination of medical services available in a larger community, e.g., Boise, Twin Falls, Pocatello, Idaho Falls, Lewiston, and Coeur d'Alene, rather than buying those services in the county of residence.

    c. In the smaller, poorer counties, the provision of long-term care by the hospital may be an expression of the community's values that long-term care is an essential service that is not being provided by the market.

2. When LTC services are available from a private firm, they are less likely to be provided by the hospital.

    a. In small counties, the market is probably large enough to accommodate not much more than a single provider. If the market, as measured by population and income, is large enough to attract a private provider, the hospital will be squeezed out.

3. Even the existence of private Assisted Living facilities acts as a deterrent to long-term care being provided by the hospital.

    a. There may be enough overlap in the kinds of services provided by LTC units and Assisted Living facilities that, in small counties, the availability of one will affect the availability of the other.

These are generalizations, from a very small sample. They may be contradicted by the experience of a specific county. It would be interesting to see if the hypotheses held true for a larger geographical area than just Idaho.

This last question also has to do with broadening the comparison between counties where the LTC facility is in the hospital with counties where long-term care is provided outside the hospital.

The following table summarizes the long-term care provided in twenty-five counties in the state. The counties are sorted into two major groups, the first where long-term care is provided by the hospital and the second where it is not provided by the hospital. The hypothesis is that there is an overlap in the services provided in an LTC unit and the services provided in Assisted Living Centers. In the fourth column, we display the total

number of Residential Care Facilities/Assisted Living Centers in each county. The fifth column identifies the number of Residential Care Facilities/Assisted Living Centers that provide only facilities for the elderly. The assumption is that this is the minimum level of care and has less of a "skilled nursing care" component. The sixth column identifies the number of these units that provide more than facilities for the elderly, i.e., Alzheimer's/Dementia, Developmentally Disabled, Mental Illness, Physically Disabled, or Traumatic Brain Injury. Column 7 identifies the number of LTC facilities in the county and the last column is the number of LTC facilities in the county that are not part of a hospital.

The following table allows us to make some interesting observations.

	LONG-TERM CARE OR SKILLED NURSING FACILITY		RESIDENTIAL CARE FACILITY OR ASSISTED LIVING CENTER				
	PART OF HOSPITAL	NOT PART OF HOSPITAL	NUMBER OF FACILITIES IN COUNTY	NUMBER PROVIDING ONLY CARE FOR ELDERLY	NUMBER PROVIDING MORE THAN JUST CARE FOR ELDERLY	LONG-TERM CARE FACILITIES IN COUNTY	LONG-TERM CARE FACILITIES OUTSIDE OF HOSPITAL
BEAR LAKE	1		1	1	0	1	0
BOUNDARY	1		3	2	1	2	1
BUTTE	1		1		1	2	1
CARIBOU	1		1	1	0	1	0
ELMORE	1		5	2	3	4	3
FRANKLIN	1		1	1	0	1	0
JEROME	1		2	1	1	2	1
MINIDOKA	1		1	1	0	1	0
ONEIDA	1		1		1	2	1
POWER	1		1	1	0	1	0
Averages			1.7	1.3	0.7	1.7	0.7
BENEWAH		1			0	1	1
BINGHAM		2	5	1	4	6	6
BLAINE		1	1	1	0	1	1
CASSIA		2	5	3	2	4	4
CLEARWATER		1	1		1	2	2
GEM		2	4	2	2	4	4
GOODING		1	1		1	2	2
IDAHO (1)	1	1	5	2	3	5	4
LATAH		3	4	3	1	4	4
LEMHI		1	1	1	0	1	1
LINCOLN		1	1	1	0	1	1
SHOSHONE		2	1	1	0	2	2
TETON			1		1	1	1
VALLEY		1	2	1	1	2	2
WASHINGTON		1	2	1	1	2	2
Averages			2.4	1.5	1.1	2.5	2.5

1. All counties have some form of long-term care, whether it is a true LTC unit in a hospital, a private LTC unit, or some level of Assisted Living.

2. In those counties that have only one Long-Term Care/Skilled Nursing Facility, the facility is most commonly found in the hospital.

3. In those counties where long-term care is provided by the hospital, the average volume of each of the other types of facilities is less than in counties where long-term care is provided by the private sector.

4. No county with two or more Long-Term Care/Skilled Nursing Facilities has any of those facilities associated with a hospital.

5. Additional long-term care in Residential Care Facilities or Assisted Living Centers is more common in those counties where the Long-Term Care/Skilled Nursing Facility is provided outside the hospital.

It is not obvious from the table, but we found in the earlier analysis that long-term care provided outside a hospital is more commonly found in those counties with the larger markets for these services. The market for such services can be measured by a combination of the county's per capita income and the county's population, especially the county's population 75 years old and older.

In those counties where the long-term care is provided outside the hospital, on average there are more LTC and Assisted Living facilities than in counties where the LTC unit is in the hospital. These counties also have a larger number of Assisted Living facilities providing elderly care, more facilities providing care in addition to elderly care, and more LTC units.

In those counties where the LTC unit is owned and operated by the hospital, the private sector is noticeably absent. It may be that the LTC unit in the hospital has control of the market which precludes the private sector operation. Alternatively, it could be that the market is too small to warrant a private facility and the private sector has chosen not to enter. In this case the public sector is forced to provide the essential service of long-term care.

XIV. Summary and Conclusions

The question we started with is: Are hospitals with LTC units different from hospitals without LTC units?

SIGNIFICANT DIFFERENCES

We found that hospitals with LTC units had more employees than those without LTC units and that the additional employees were located in the LTC units. This is a rather trivial conclusion and it seems more a result of having a long-term care unit rather than a cause for having one. Nor is it associated with any unique behavior or problem of Critical Access Hospitals with LTC units. We found that hospitals with LTC units had a smaller ratio of Outpatient Revenues to Total Revenues than hospitals without LTC units. Because patient revenues from LTC units are not Outpatient Revenues, this also seems like a reasonable conclusion. Again, this is more of a result of having a long-term care unit rather than a cause.

NO SIGNIFICANT DIFFERENCES

With respect to the other measures, we found no significant difference between hospitals with LTC units and hospitals without LTC units.

Given that these are small hospitals in small communities, it seems these are reasonable conclusions. We would expect that small hospitals in small communities, all restricted by the regulations governing Critical Access Hospitals, would behave the same and share the same characteristics. The weakness of this analysis is that we are comparing hospitals using only one measure at a time.

We used multivariate regression to see if by controlling for other variables we could discover a relation between a hospital's profitability and the existence of an LTC unit. We found that for Critical Access Hospitals, and controlling for growth in the county's per capita income, distance to the nearest tertiary hospital, and the percent of the county's population in poverty, we could find an inverse relation between the existence of an LTC unit in the hospital and the hospital's profitability.

Thus, while we could find no differences between Critical Access Hospitals with and without LTC units when comparing them one measure at a time, the use of multiple regression analysis did provide evidence that LTC units do detract from a hospital's profits.

We also used multivariate regression to see if there were some set of variables that could explain the difference between the two kinds of Critical Access Hospitals, those with and those without an LTC unit. In this instance, we came closer to finding a cause for an LTC unit in a hospital. We found that Critical Access Hospitals are more likely to have a long-term care unit if:

- They are located in communities or counties with no private LTC unit.
- They are located in communities or counties with a small number of beds in Assisted Living Centers.
- They are located in communities or counties with a large proportion of the population between the ages of 18 and 65.
- They are located in communities with small populations and low per capita incomes.

We conclude that long-term care is generally available in each county. Even in these small communities, those with larger markets are more likely to have long-term care provided by a private firm. The size of the market is measured by both population and income. In small counties with high per capita income (e.g., Blaine County), the long-term care is provided privately. In counties with a larger population, but with lower per capita income (e.g. Bear Lake County), the service is provided by the hospital.

We have also found evidence that there is some overlap of services between facilities that are designated as LTC units and those facilities that are designated as Assisted Living Centers. The more Assisted Living

Centers there are in a county and the more rooms provided in these Assisted Living Centers, the less likely that the long-term care will be provided by the hospital.

POLICY IMPLICATIONS

The finding that LTC units in the hospital do not contribute to the hospital's profitability could be the result of LTC units being forced into the Prospective Payment System. One could then make the argument for a more favorable payment scheme, i.e., Cost-Based Reimbursement, for these small hospitals.

It could also mean that because the market is not large enough to warrant the services of a private facility, the hospital is being "forced" to provide the service at a loss or at least at a lower return. In a free market, firms would have an incentive to raise their price and/or reduce the quality and quantity of services. Under Medicare regulations and local policy, this may be impossible.

Lastly, we consider the consequences of these conclusions. As mentioned above, private long-term care is more likely to be found in those counties where the population and income can support a private facility. It is reasonable to predict then, that as incomes and population grow in these small counties, the LTC units in the hospitals will be subject to a greater degree of competition and the number of LTC units in rural hospitals will decline over time. This will be most noticeable (1) in those counties close to large urban areas that become bedroom communities for the metropolitan area, e.g. Gem County, and (2) in those counties experiencing the most rapid growth in population and income, e.g. Valley County. The competition will be less in the more rural counties, with smaller populations and less growth in income, e.g., Bear Lake County. We wouldn't be so presumptuous as to predict a time schedule.

If LTC units in small rural hospitals are a "declining industry," it provides the basis for arguing that the reimbursement scheme need not be changed and that this de facto deregulation will solve the problem as private facilities take market share from the hospital-based facilities. This conclusion applies only to a specific type of county whose population and income are growing more rapidly than others. For the traditional small rural county, with little or no growth, this offers little or no solution.

APPENDIX A: DATA METHODS & DEFINITION OF VARIABLES

The Hospital Cost Report data sets were downloaded in three tables (Report, Alpha, and Alpha-numeric) from the website of the National Bureau of Economic Research and opened via SAS version 8.0. Idaho hospitals were identified by provider number in the "Report" data set. All Idaho hospital provider numbers begin with "13" and 379 different record numbers were identified. The "Alpha" and "Alpha-numeric" data sets were then sorted using record numbers to include only records from Idaho hospitals. Once each data set contained only Idaho hospital information, the three separate data sets were combined into one large data set by record number using JMP IN 5.1 (SAS Institute) and Microsoft Excel.

Variables were operationally defined as follows: (The ones with an asterisk were the ones used in the analysis.)

Indicator	Definition & Source	
Profitability Indicators		
Total Margin*	net income / total revenues	Worksheet G-3, line 31 / G-3, line 3+25
Cash Flow Margin*	net income-(contrib.., invest, & appropr + Depreciation expenses + interest expense) / net patient revenue + other income-contributions, investments, & appropriations	Worksheet G-3, line 31 - G-3, lines 6,7,23 + worksheet A, col 3, lines 1-4 + A, col 3, line 88 / G-3, line 3 + G-3, line 25 – G-3, lines 6,7,23
Return on Equity*	Net income / Fund balance	Worksheet G-3, line 31 / G, col 1-4, line 51
Liquidity Indicators		
Current Ratio	Current assets / Current liabilities	Worksheet G, col. 1-4, line 11 / G, col. 1-4, line 36
Days Cash on Hand*	Cash + marketable securities + unrestricted investments / (total expenses – depreciation) / days in period	Worksheet G, col. 1-4, lines 1,2,22 / A, col. 3, line 101 – A, col. 3, lines 1-4) / days in period
Capital Structure Indicators		
Equity Financing*	Fund balance / Total assets	Worksheet G, col. 1-4, line 51 / G, col. 1-4, line 27
Revenue Indicators		
Outpatient Revenues to Total Revenues*	Total outpatient revenue / Total patient revenue	Worksheet G-2, col. 2, line 25 / G-2, col. 3, line 25
Patient Deductions*	Contractual allowances + discounts / Gross total patient revenue	Worksheet G-3, line 2 / G-3, line 1
Medicare Inpatient Payer Mix*	Medicare inpatient days / Total inpatient days – nursery bed days – NF swing bed days	Worksheet S-3, col. 4, line 12 / S-3, part I, col. 6, line 12 – S-3, part I, col. 6, line 11 – S-3, part I, col. 6, line 4
Medicare Outpatient Payer Mix*	Outpatient Medicare charges / Total outpatient charges	Worksheet D, col. 2-5, 5.01, 5.02, line 104, part V, Title XVIII, (hospital) / C, col. 7, line 101, part I

Cost Indicators		
Salaries to Total Expenses*	Salary expense / Total expenses	Worksheet A, col. 1, line 101 / A, col. 3, line 101
Average Age of Plant	Accumulated depreciation / Depreciation expense	Worksheet G, col. 1-4, lines 13.01-19.01 / A, col. 3, lines 1-4
FTEs per Adjusted Occupied Bed*	Number of FTEs / (inpatient days – NF swing days – nursery days) * (total patient revenues / (total inpatient NF revenue – other LTD revenue)) \ days in period	Worksheet S-3, part I, col. 10, line 25 / S-3, col. 6, line 12 – S-3, col. 6, line 4 – S-3, col. 6, line 11) * (G-2, revenue-skilled col. 3, line 25 / G-2, col. 1, line 25 – G-2, col. 1, line 7 – G-2, col. 1, line 8)) / days in period
Utilization Indicators		
Average Daily Census Swing-SNF Beds*	Inpatient swing bed SNF days / Days in period	Worksheet S-3, col. 6, line 3, part I / Days in period
Average Daily Census Acute Beds*	Inpatient acute care bed days / Days in period	Worksheet S-3, col. 6, line 12 – (line 3 + 4 + 11, part I) / Days in period

Sources of economic and demographic data.

1. County population.
   a. By age group.
   Idaho Department of Commerce.
   County Demographic Profile found at:
   http://cl.idaho.gov/Portal/ICL/alias__jobservice/tabID__5048/DesktopDefault.aspx
   b. Percent of population below poverty level
   There are many sources, but the primary source is the U.S. Census Bureau.
   http://www.census.gov/cgi-bin/saipe/saipe.cgi.

2. County per capita income.
   Bureau of Economic Analysis, Table CA1-3, Per Capita Personal Income, Idaho.

3. Data on Long-Term Care units and Assisted Living Facilities by county.
   Bureau of Facility Standards, Idaho Department of Health and Welfare, "Residential Care Facility/Assisted Living", October 5, 2005.
   _____, "Long Term Care/Skilled Nursing Facility", October 5, 2005.
   (Both documents can be found at: http://www.healthandwelfare.idaho.gov/site/3350/default.aspx)